

**Fat and oil derivatives - Fatty acid methyl ester (FAME) - Determination of Ca, K, Mg and Na content by optical emission spectral analysis with inductively coupled plasma (ICP OES)**

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## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 14538:2006 sisaldab Euroopa standardi EN 14538:2006 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 31.07.2006 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 14538:2006 consists of the English text of the European standard EN 14538:2006.</p> <p>This document is endorsed on 31.07.2006 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b> This document specifies a procedure for the direct determination of the soap building elements Calcium (Ca), Magnesium (Mg), Sodium (Na) and Potassium (K) in fatty acid methyl esters (FAME) by ICP OES at levels of about 1 mg/kg to 10 mg/kg.</p>	<p><b>Scope:</b> This document specifies a procedure for the direct determination of the soap building elements Calcium (Ca), Magnesium (Mg), Sodium (Na) and Potassium (K) in fatty acid methyl esters (FAME) by ICP OES at levels of about 1 mg/kg to 10 mg/kg.</p>
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ICS 67.200.10

Võtmesõnad:

ICS 67.200.10

English Version

Fat and oil derivatives - Fatty acid methyl ester (FAME) -  
Determination of Ca, K, Mg and Na content by optical emission  
spectral analysis with inductively coupled plasma (ICP OES)

Produits dérivés des corps gras - Esters méthyliques  
d'acides gras (EMAG) - Détermination de la teneur en Ca,  
K, Mg et Na par spectrométrie d'émission optique avec  
plasma à couplage inductif (ICP OES)

Erzeugnisse aus pflanzlichen und tierischen Fetten und  
Ölen - Fettsäure-Methylester (FAME) - Bestimmung von  
Ca, K, Mg und Na durch optische  
Emissionsspektralanalyse mit induktiv gekoppeltem  
Plasma (ICP OES)

This European Standard was approved by CEN on 10 May 2006.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

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## Foreword

This document (EN 14538:2006) has been prepared by Technical Committee CEN/TC 19 “Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin”, the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2006, and conflicting national standards shall be withdrawn at the latest by December 2006.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

## 1 Scope

This document specifies a procedure for the direct determination of the soap building elements Calcium (Ca), Magnesium (Mg), Sodium (Na) and Potassium (K) in fatty acid methyl esters (FAME) by ICP OES at levels of about 1 mg/kg to 10 mg/kg.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 3170, *Petroleum liquids - Manual sampling (ISO 3170:2004)*

EN ISO 3171, *Petroleum liquids - Automatic pipeline sampling (ISO 3171:1988)*

## 3 Principle

An exactly weighed test portion is diluted with kerosene using a 1:1 weight ratio. The resulting solution is directly injected into the plasma of the ICP OES spectrometer. For reference and calibration purposes, calibration samples with known contents of the element(s) under investigation in the range of 0,5 mg/kg to 10 mg/kg are used. The sum of the content of Calcium and the content of Magnesium, and the sum of the content of Sodium and the content of Potassium are reported.

## 4 Chemicals

Unless otherwise stated, only chemicals of recognized analytical quality shall be used.

**4.1 Paraffin oil**, low viscosity, Pharmacopeia (EUPHARM EP5), e.g. Merck 107174<sup>1)</sup>

**4.2 Kerosene**, boiling range included between 150 °C and 325 °C, e.g. Aldrich 32.946-0<sup>1)</sup>

**4.3 Element Standard solutions**, dissolved in oil, 500 mg/kg per element. These are available as single element standards, like e.g. Merck 115053 (Ca), 115057 (Mg), 115054 (K) and 115058 (Na), or also at least partially as multi-element standards, (e.g. Spex)<sup>1)</sup>.

**4.4 Argon**, with minimum purity  $w(\text{Ar}) = 99,996\%$  (V/V)

## 5 Apparatus

Commercial laboratory and glass equipment, in conjunction with the following:

**5.1 100 ml bottles with cap**, preferably made of Polyethylene (PE), brown

**5.2 250 ml bottles with cap**, preferably made of Polyethylene (PE), brown

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1) Merck, Aldrich and Spex standards are examples of a suitable product available commercially. This information is given for the convenience of users of this standard and does not constitute an endorsement by CEN of these products.